



TETRA TECH

May 23, 2016

Ms. Erin McCoy
Remedial Project Manager
U.S. Environmental Protection Agency, Region 7
11201 Renner Blvd
Lenexa, Kansas 66219

Subject: **Quality Assurance Project Plan for Site Characterization Sampling Activities
Des Moines TCE Site, Des Moines, Iowa
U.S. EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0144
Task Monitor: Erin McCoy**

Dear Ms. McCoy:

Tetra Tech, Inc. is submitting the attached Quality Assurance Project Plan for site characterization sampling activities at the Des Moines TCE Site in Des Moines, Iowa. If you have any questions or comments, please contact me at (816) 412-1767.

Sincerely,

Mike Williams
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

cc: Debra Dorsey, START Project Officer (cover letter only)

**QUALITY ASSURANCE PROJECT PLAN
FOR SITE CHARACTERIZATION SAMPLING ACTIVITIES AT THE
DES MOINES TCE SITE
DES MOINES, IOWA**

**Superfund Technical Assessment and Response Team (START) 4
Contract No. EP-S7-13-06, Task Order 0144**

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division/Special Emphasis Remedial Branch
11201 Renner Blvd.
Lenexa, Kansas 66219

May 23, 2016

Prepared By:

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Region 7 Superfund Program/Special Emphasis Remedial Branch
Addendum to the Generic QAPP for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
for the Des Moines TCE Site

Project Information:

Site Name: Des Moines TCE Site		Location: Des Moines	State: IA
EPA Project Manager: Erin McCoy		START Project Manager: Mike Williams	
Approved By:	<i>[Signature]</i>	Prepared For: EPA Region 7 Superfund Division/Iowa Nebraska Remedial Branch	
Title:	START Project Manager		
Date:	5-24-2016		
Approved By:	<i>[Signature]</i>	Prepared By: John Simpson Date: May 2016	
Title:	START Program Manager		
Date:	5-24-16		
Approved By:	<i>[Signature]</i>	Tetra Tech START Project Number: X9025.16.0144.000	
Title:	START QA Manager		
Date:	5-24-16		
Approved By:			
Title:	EPA Project Manager		
Date:			
Approved By:			
Title:	EPA Region 7 QA Manager		
Date:			

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: Erin McCoy, EPA Project Manager
Diane Harris, EPA Region 7 QA Manager

Tetra Tech START: Mike Williams, Project Manager
Kathy Homer, QA Manager

1.2 Project/Task Organization

Erin McCoy, of the EPA Region 7 Superfund Division/Iowa Nebraska Remedial Branch, will serve as the EPA Project Manager for the activities described in this QAPP. Mike Williams, of Tetra Tech, Inc., (Tetra Tech), will serve as the START Project Manager.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012) and contains site-specific data quality objectives for the sampling activities described herein.

- ☒ Description attached.
- ☐ Description in referenced report: _____
- Title _____ Date _____

1.4 Project/Task Description:

- ☐ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment ☐ Removal Action
- ☒ Other (description attached): ☐ Pre-CERCLIS Site Screening ☐ Removal Site Evaluation

Other Description: Supplemental Remedial Investigation

Schedule: Field activities are anticipated to occur in June 2016.

- ☐ Description in referenced report: _____
- Title _____ Date _____

1.5 Quality Objectives and Criteria for Measurement Data:

- | | |
|------------------------|---|
| a. Accuracy: | <input checked="" type="checkbox"/> Identified in attached table. |
| b. Precision: | <input checked="" type="checkbox"/> Identified in attached table. |
| c. Representativeness: | <input checked="" type="checkbox"/> Identified in attached table. |
| d. Completeness*: | <input checked="" type="checkbox"/> Identified in attached table. |
| e. Comparability: | <input checked="" type="checkbox"/> Identified in attached table. |

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data. No critical samples have been identified.

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1.6 Special Training/Certification Requirements:

☒ OSHA 1910 ☒ Special Equipment/Instrument Operator (describe below): ☐ Other (describe below):

Along with the training listed above, familiarization with a photoionization detector and its operating procedures will be necessary for the Tetra Tech START team.

1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☐ Trip Report ☒ Site Maps ☐ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

- ☒ Sample documentation will follow EPA Region 7 SOP 2420.05.
☒ A copy of this QAPP and any future amendments will be available to all personnel throughout sampling activities. Original documents will be maintained by EPA.
☒ Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☐ Screening w/ Definitive Confirmation ☐ Incremental Sampling Methodology
☒ Sample Map Attached

☒ Other (Provide rationale behind each sample): See Appendix A for additional sampling information.

The proposed sampling scheme will be biased/judgmental sampling with definitive laboratory analysis, in accordance with the *Guidance for Performing Site Inspections Under CERCLA*, Office of Solid Waste and Emergency Response (OSWER) Directive #9345.1-05, September 1992. Judgmental sampling is subjective (biased) selection of sampling locations based on historical information, visual inspection, and best professional judgment of sampler(s).

Exact sample locations will be determined during reconnaissance activities in the field. Sample locations will be documented by use of a handheld global positioning system (GPS) device or by measuring from two fixed locations. The proposed number of samples is a balance between cost and coverage, and represents a reasonable attempt to meet the study objectives while staying within the budget constraints of a typical site investigation.

Sample Summary Location	Matrix	# of Samples*	Analysis
Buildings 1, 2, 3, and Production Building – Building Foundation Structures (i.e. concrete slab floors, steel structural beams) (3-4 samples per building plus up to 20 additional samples collected at the Process Building)	Wipe Samples	36	Polychlorinated biphenyls (PCB), dioxin, and organochlorine pesticides
Buildings 1, 2, 3, and Production Building – Building Materials (i.e. insulation, brick, wood, etc.) (3-4 samples per building plus up to 20 additional samples collected at the Process Building)	Bulk Building Materials	36	PCBs, dioxin, and organochlorine pesticides
Buildings 1-5, Maintenance Building, and Production Building – Concrete (2-4 locations per building)	Concrete	17	PCBs, dioxin, and organochlorine pesticides
Buildings 1-5, Maintenance Building, and Production Building – Sub-slab soil samples (2-4 locations per building, samples every 5 feet to top of water table, approximately 20 to 25 feet below ground surface [bgs])	Soil	Up to 85**	Volatile organic compounds (VOCs), PCBs, dioxin, organochlorine pesticides, and chlorinated herbicides.
South Pond Area – Sediment	Soil	10	VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides.
South Pond Area – Surface water	Water	2	VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides.

Notes: *QC and background samples are not included with these totals. See Table 1 for a complete sample summary.

**Number of samples is based on depth to groundwater, up to 25 feet bgs.

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2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s) or other Method
Wipe Samples	Wipe samples will be collected from 100-square-centimeter areas by use of sterile gauze pads wetted with a solvent such as hexane.	EPA SOP 4231.2011
Bulk Building Materials	Samples of insulation, wood, and brick, etc., will be collected by use of scissors, chisel, or other appropriate hand tools.	EPA SOP 4231.2011 (modified)
Concrete	Samples of concrete building foundation slabs will be collected by use of a direct-push technology (DPT) rig equipped with a hammer drill attachment.	EPA SOP 4231.2011 (modified)
Soil	A DPT rig with a Macro-Core sampler will be used to advance soil borings. Soil samples will be collected at 5-foot intervals to the top of the water table at approximately 20 to 25 feet bgs.	EPA SOPs 4230.03, 4230.07, and 4231.2012
Surface Soil and Sediment	Surface soil and sediment samples will be collected by use of a stainless steel hand auger and stainless steel spoons.	EPA SOP 4232.2016
Water – Surface water	Surface water samples will be collected directly into sample containers.	EPA SOP 4232.2013

2.3 Sample Handling and Custody Requirements:

- ☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06.
- ☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04.
- ☒ Samples submitted to the EPA Region 7 laboratory will be accepted according to Region 7 EPA SOP 2420.01.
- ☒ Other (Describe): Samples will be accepted in accordance with procedures established by the START-subcontracted laboratories.

2.4 Analytical Methods Requirements:

- ☒ Identified in attached table.
- ☒ Rationale: The requested analyses have been selected based on historical information about the site and program experience with similar types of sites.
- ☐ Other (Describe):

2.5 Quality Control Requirements

- ☐ Not Applicable
- ☒ Identified in attached table.
- ☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
- ☒ Field QC Samples: For this investigation, field QC samples will include duplicates numbered at 5% of collected samples (1 duplicate per 20 samples of each matrix submitted to the lab), as well as one matrix/matrix spike duplicate. One field blank (water) of deionized (DI) water, provided by the EPA Region 7 laboratory, will be submitted with each cooler. The field blank will be collected to evaluate contamination of sampling containers and/or preservatives, and to assess contamination potentially introduced during sampling and laboratory procedure(s). One water trip blank will be prepared by the EPA Region 7 laboratory for use in evaluating contamination introduced during transportation of the containers/samples. One equipment rinsate blank will be collected per sampling device to evaluate decontamination procedures. Evaluation of blank samples depends on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results from blank samples will be evaluated on a qualitative basis by the EPA Project Manager and EPA contractor(s) to determine a general indication of field-introduced and/or lab-introduced contamination. Analytical results from field duplicate samples will be referenced to calculate the relative percent difference (RPD) between each set of duplicate pair results for each reported analyte. Relative percent differences between analyte concentrations in duplicate samples will be used for informational purposes only. All QC samples will be submitted for the analyses listed in the attached tables.

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

- ☐ Not Applicable
- ☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
- ☒ Testing, inspection, and maintenance of analytical instrumentation will accord with the previously referenced SOPs and/or manufacturers' recommendations. Testing, inspection, and maintenance of field instruments (Global Positioning System [GPS] units, PIDs, etc.) will accord with manufacturers' recommendations.

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2.7 Instrument Calibration and Frequency:

- ☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Calibration of laboratory equipment will proceed as described in the previously referenced SOPs and/or manufacturers' recommendations.
☒ Other (Describe): Calibration checks of field instruments will occur daily, as specified in the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

- ☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers*.
☐ Other (Describe):

2.9 Data Acquisition Requirements:

- ☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☒ Previous data or information pertaining to the site (including other analytical data, reports, photos, maps, etc., that are referenced in this QAPP) have been compiled by EPA and/or its contractor(s) from other sources. Some of that data have not been verified by EPA and/or its contractor(s); however, that unverified information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data or information.
☐ Other (Describe):

2.10 Data Management:

- ☒ All data acquired by the EPA Region 7 laboratory will be managed in accordance with Region 7 EPA SOP 2410.01.
☒ Other (Describe): Laboratory data acquired at the START-subcontracted laboratory will be managed in accordance with its established procedures.

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

- ☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit
☒ Assessment and response actions pertaining to analytical phases of the project associated with the EPA Region 7 laboratory are addressed in Region 7 EPA SOPs 2430.06 and 2430.12.
☒ Other (Describe): Assessment and response actions pertaining to analytical phases of the project will accord with procedures established by the START-subcontracted laboratory.

3.1A Corrective Action:

- ☒ Corrective actions will be at the discretion of the EPA Project Manager whenever problems appear that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.
☐ Other (Describe):

3.2 Reports to Management:

- ☐ Audit Report ☐ Data Validation Report ☐ Project Status Report ☐ None Required
☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by START and submitted to the EPA.
☒ Reports will be prepared in accordance with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

- ☐ Identified in attached table.
- ☒ Data review and verification will accord with the Generic Quality Assurance Project Plan for Superfund Site Assessment and Targeted Brownfields Assessment Programs (updated October 2012).
- ☒ Data review and verification of analytical results generated by the EPA Region 7 laboratory will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.12 and 2410.10.
- ☒ Other (Describe): Data review and verification of analytical results generated by the START-subcontracted laboratory will be performed by a qualified analyst and the laboratory manager.

4.2 Validation and Verification Methods:

- ☐ Identified in attached table.
- ☒ The data generated by the EPA Region 7 laboratory will be validated in accordance with Region 7 EPA SOPs 2430.12 and 2410.10.
- ☒ The EPA Project Manager will inspect the data to provide a final review. The EPA Project Manager will review the data, if applicable, for laboratory spikes and duplicates, laboratory blanks, and field duplicates to ensure the data are acceptable. The EPA Project Manager will also compare the sample descriptions with field sheets for consistency, and will ensure appropriate documentation of any anomalies in the data.
- ☒ Other (Describe): If any problems with field measurements or analytical data are identified by data verification/validation, the EPA Project Manager will be informed and the START Contractor will explain the circumstances of the problem, describe any corrective actions taken, and provide an opinion on the limitations and usefulness of the data.

4.3 Reconciliation with User Requirements:

- ☐ Identified in attached table.
- ☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA Project Manager.
- ☐ Other (Describe):

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Table 1: Sample Summary

Site Name: Des Moines TCE				Location: Des Moines, IA			
START Project Manager: Mike Williams				Activity/ASR #: To be determined		Date: May 2016	
No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Methods	Analytical Method
Buildings 1-5, Maintenance Building, Production Building							
36	Wipe samples	Buildings 1, 2, 3, and Production Building	To determine presence and concentrations of PCBs, pesticides, and dioxin	Building structural members	PCBs, dioxin, and organochlorine pesticides	EPA SOP 4231.2011	EPA SOP 3240.02
36	Building Materials	Buildings 1, 2, 3, and Production Building	To determine presence and concentrations of PCBs, pesticides, and dioxin	Building materials (i.e. insulation, brick, wood, etc.)	PCBs, dioxin, and organochlorine pesticides	EPA SOPs 4231.2011 (modified)	EPA SOP 3240.02
17	Concrete	Concrete slabs (Buildings 1-5, Maintenance Building, and Production Building)	To determine presence and concentrations of PCBs, pesticides, and dioxin	Not applicable (NA)	PCBs, dioxin, and organochlorine pesticides	EPA SOPs 4231.2011 (modified)	EPA SOP 3240.02
85	Soil	DPT soil borings advanced within the building footprints (Buildings 1-5, Maintenance Building, and Production Building)	To determine presence and concentrations of VOCs, PCBs, pesticides, herbicides, and dioxin	5-foot sample intervals from surface to water table (20 to 25 feet bgs)	VOCs, PCBs, dioxin (uppermost sample interval only), organochlorine pesticides, and chlorinated herbicides.	EPA SOPs 4230.03, 4230.07, and 4231.2012	EPA SOPs 3230.16, 3240.02
South Pond Area							
10	Sediment	South Pond	To determine presence and concentrations of VOCs, PCBs, pesticides, and herbicides	8 samples evenly spaced around the perimeter of the pond and 2 samples from the submerged area of the pond	VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides	EPA SOP 4232.2016	EPA SOPs 3230.16, 3240.02
2	Surface Water	South Pond	To determine presence and concentrations of VOCs, PCBs, pesticides, and herbicides	Inlet and outfall sides of the pond	VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides	EPA SOP 4232.2013	EPA SOPs 3230.13, 3240.02

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Table 1: Sample Summary (Continued)

No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Methods	Analytical Method
QC Samples							
Duplicates							
2	Wipe samples	Field Duplicates – Building Materials samples	To assess precision of analytical and sampling methods	Building structural members	PCBs, dioxin, and organochlorine pesticides	EPA SOP 4231.2011	EPA SOP 3240.02
1	Concrete Samples	Field Duplicate – Concrete Sample	To assess precision of analytical and sampling methods	Concrete	PCBs, dioxin, and organochlorine pesticides	EPA SOPs 4231.2011 (modified)	EPA SOPs 3240.02
Up to 5	Soil	Field Duplicates – DPT soil borings	To assess precision of analytical and sampling methods	5-foot sample intervals from surface to water table (20 to 25) feet bgs	VOCs, PCBs, dioxin, organochlorine pesticides, and chlorinated herbicides	EPA SOPs 4230.03, 4230.07, and 4231.2012	EPA SOPs 3230.16, 3240.02
1	Sediment	Field Duplicate – South Pond	To assess precision of analytical and sampling methods	NA	VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides	EPA SOP 4232.2016	EPA SOPs 3230.16, 3240.02
1	Surface water	Field Duplicate – South Pond	To assess precision of analytical and sampling methods	NA	VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides	EPA SOP 4232.2013	EPA SOPs 3230.13, 3240.02
Blanks							
1	Water	Equipment rinsate blank	Evaluate decontamination procedures	NA	VOCs, PCBs, dioxin, organochlorine pesticides, and chlorinated herbicides	NA	EPA SOPs 3230.13, 3240.02
1	Water	Field blank	Assess field-introduced and lab-introduced contamination	NA	VOCs, PCBs, dioxin, organochlorine pesticides, and chlorinated herbicides	NA	EPA SOPs 3230.13, 3240.02
1	Water	Trip blank	Assess transportation-introduced contamination	NA	VOCs	NA	EPA SOP 3230.13

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Table 2: Data Quality Objectives Summary

Site Name: Des Moines TCE Site				Location: Des Moines, IA				
START Project Manager: Mike Williams				Activity/ASR #: To be determined			Date: May 2016	
Analysis	Analytical Method	Data Quality Measurements					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representativeness	Completeness	Comparability		
Wipe Samples								
PCBs, dioxin, and organochlorine pesticides	See Table 1	Per analytical method	Per analytical method	Judgmental sampling based on professional judgment of the sampling team	100%; No specific critical samples have been identified.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
Building Materials Samples								
PCBs, dioxin, and organochlorine pesticides	See Table 1	Per analytical method	Per analytical method	Judgmental sampling based on professional judgment of the sampling team	100%; No specific critical samples have been identified.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
Concrete Samples								
PCBs, dioxin, and organochlorine pesticides	See Table 1	Per analytical method	Per analytical method	Judgmental sampling based on professional judgment of the sampling team	100%; No specific critical samples have been identified.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
Soil Samples								
VOCs, PCBs, dioxin, organochlorine pesticides, and chlorinated herbicides	See Table 1	Per analytical method	Per analytical method	Judgmental sampling based on professional judgment of the sampling team	100%; No specific critical samples have been identified.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
Sediment Samples								
VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides	See Table 1	Per analytical method	Per analytical method	Judgmental sampling based on professional judgment of the sampling team	100%; No specific critical samples have been identified.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
Surface Water								
VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides	See Table 1	Per analytical method	Per analytical method	Judgmental sampling based on professional judgment of the sampling team	100%; No specific critical samples have been identified.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.

APPENDIX A

SITE-SPECIFIC INFORMATION REGARDING ADDITIONAL REMEDIAL INVESTIGATION ACTIVITIES AT THE DES MOINES TCE SITE

INTRODUCTION

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division, under contract number EP-S7-13-06, to support an update of a feasibility study (FS) that will require additional investigative sampling. Purposes of the investigation are to (1) assess impacts on soil, sediment, and surface water at the site; and (2) assess remaining buildings hazardous substances in anticipation of possible building demolition and redevelopment. This investigation will proceed under authority of the Comprehensive Environmental Response, Compensation, and Liability act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization act of 1986 (SARA).

Remedial investigation tasks will include, but not be limited to collections of the following samples for analyses for chemicals of concern (COC):

- ☐ Wipe samples from building surfaces
- ☐ Concrete core samples from building foundations and slabs
- ☐ Sub-slab soil samples (by use of Geoprobe[®] direct-push technology [DPT])
- ☐ Building material samples
- ☐ Soil/sediment samples from the South Pond
- ☐ Surface water samples from the South Pond.

This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for the investigation.

SITE BACKGROUND INFORMATION

Information regarding the site's location and description, and operational and investigative history is as follows:

Site Location/Description

The Des Moines Trichloroethene (TCE) site is in south-central Des Moines on the east side of the Raccoon River. The site is mainly associated with a 43-acre property formerly operated by DICO, Inc. (DICO). The DICO site is southwest of the intersection of W. Martin Luther King Jr. Parkway and SW 16th Street in Des Moines, Polk County, Iowa (see Appendix B, Figure 1).

The site is in Section 8, Township 78 North, Range 42 West. Geographic coordinates at the approximate center of the site are 41.579293 degrees (°) North latitude and 93.638964° West longitude.

Surface water across the site generally drains from north to south. Surface water also collects in the South Pond and overflows into the east drainage ditch. The southern portion of the site is within the Raccoon River flood plain. The South Pond on the DICO property is a wetland.

Site geology consists of about 50 feet of alluvial sands and gravel, underlain by about 500 feet of shale and limestone. However, the soil profile on the DICO property has been altered by use of fill material to raise the elevation above flood elevations. The saturated zone begins at a depth of about 20 feet below ground surface (bgs). Natural groundwater flow direction at the site follows regional groundwater flow patterns paralleling the Raccoon River toward the south-southeast.

Site Operational and Investigative History

For approximately 40 years, the DICO property was used for a variety of industrial uses/operations that included steel wheel manufacturing, chemical and herbicide distribution, and pesticide formulation processes. Supporting these activities were a grey iron foundry and a steel wheels manufacturing plant. Releases during DICO's operations at the site included the following: TCE, 1,2-dichloroethene (DCE), and vinyl chloride to groundwater; residual pesticides and metals to shallow soils; and pesticides within buildings, to soils on the southern end of the property, and within drainage areas. The site has been divided into four operable units (OU):

- ☐ OU 1 – groundwater TCE plume on the DICO property
- ☐ OU 2 – originated as source soils associated with TCE groundwater contamination, but later focused on residual pesticides and metals in shallow soils
- ☐ OU 3 – a source area of tetrachloroethene (PCE) groundwater contamination north of DICO
- ☐ OU 4 – pesticides in buildings and soil on the southern end of the DICO property (a.k.a., South Pond Area [SPA]), and in drainage areas of the DICO property.

A groundwater pump and treat (P&T) system has operated at the site since 1987. Since that time, the groundwater plume has been effectively contained on the DICO property. Currently, three extraction wells and an air stripper are in operation. DICO continues to operate and maintain the groundwater P&T system.

Discovery that pesticides and metals in soils presented a health threat occurred during investigation of the OU2 area as a possible source of the groundwater contamination. The same pesticides and metals were also found in OU4 soils and buildings. A series of removal actions in the early 1990s addressed the pesticides and metals in soils and the buildings by cleaning the building surfaces and applying epoxy paint, and by constructing an asphalt cap on most of the DICO property. In March 1994, EPA signed a Unilateral Administrative Order (UAO) to address contamination associated with various interior portions of the DICO Building 1 through 5 and the Maintenance Building. In 1996, EPA signed a Record of Decision (ROD) for OU2 and OU4 calling for continued maintenance of the asphalt cap and building encapsulation actions, and institutional controls to maintain an industrial land use (EPA, 1996). Action levels were set at industrial levels because property use was expected to remain industrial. DICO continues to maintain the asphalt cap. Maintenance requirements for the buildings were reduced when DICO ceased operations inside the buildings. In 2007, DICO erected a 6-foot chain link security fence around much of its property to reduce vandalism of the buildings. Also, DICO dismantled the Maintenance Building and Buildings 4 and 5 without prior notification to EPA, which resulted in improper disposal of polychlorinated biphenyl (PCB)-contaminated insulation.

In 2015, EPA performed a screening level ecological risk assessment of the SPA as part of OU4. Sediment and surface water samples were collected. A potential significant risk was determined due to presence of pesticides and PCBs. As a result, EPA is changing the protectiveness statement regarding the site in the 2013 Five-Year Review from “deferred” to “not protective.” EPA is suggesting a human health assessment due to potential exposure of the homeless community that has resided on site.

The Des Moines Water Works (DMWW), which supplies potable water to the City of Des Moines, is immediately across the Raccoon River west of the DICO property. The design objective for the on-site groundwater extraction system is to prevent TCE-impacted groundwater from migrating beneath the Raccoon River and entering areas used by the DMWW on the west side.

CURRENT AND ENVISIONED USES OF THE DICO PROPERTY

Manufacturing operations at the site have been discontinued. Currently, the DICO property is used only for operating and maintaining the OUI groundwater extraction and treatment system, maintaining the asphalt cap, and maintaining the buildings pursuant to the UAO and implementation of an Operation and Maintenance Plan for the buildings. The DICO property is fenced, and the site owner provides site security.

Land use within the area surrounding DICO is changing. Much of this surrounding area has been rezoned. For several years, Des Moines has been planning a major redevelopment project in the River Point West area east of the DICO property. EPA supports redevelopment of the DICO property, and envisions a wide variety of possible uses, assuming the following: (1) the groundwater P&T system continues to operate effectively, (2) protective measures are in place to prevent exposure to contaminated soils and contamination in buildings, and (3) contamination on and under the remaining pads from demolished buildings, and contamination in the remaining buildings are fully characterized and addressed. To these ends, this investigation will include sampling of the buildings and SPA that will support development of a reasonable cost estimate for building demolition, and a risk assessment of the SPA to support an amendment to the ROD.

SAMPLING STRATEGY AND METHODOLOGY

Tetra Tech START will collect the following samples within current and former building areas: dust wipes from building structural components, bulk samples of building materials, concrete core samples, and subsurface soil samples. Also, sediment and surface water samples will be collected within the SPA.

Initiation of sampling and assessment activities is tentatively scheduled for early June 2016, and will require two or three START sampling personnel and a DPT rig operator. Field activities are expected to take approximately 1 week.

A summary of all anticipated samples for this project is in Table 1 of the attached QAPP form. The standard operating procedures (SOP) and chain-of-custody procedures referenced in the QAPP will be followed throughout sampling activities to verify integrity of the samples from time of collection until submittal to the laboratory for analyses. Samples will be delivered to the EPA Region 7 laboratory in Kansas City, Kansas and a START-subcontracted analytical laboratory, for analyses according to the SOPs and methods referenced or described in the QAPP.

Descriptions of the sampling strategy and procedures are as follows:

Dust Wipe Sampling

Approximately three to four wipe samples per building (Buildings 1, 2, 3, and the Production Building) will be collected from building foundation structures such as concrete slab floors, structural steel beams for analyses for PCBs, dioxin, and organochlorine pesticides. Due to its larger size and lack of previous sampling data for the Production Building, EPA requested that approximately 20 additional samples be collected in the Production Building. The wipe samples will be collected by use of sterile gauze pads,

which will be wetted with a solvent (e.g., hexane) recommended by the receiving laboratory. Each wipe sample will be collected from a 100-square-centimeter area and placed into a jar with a Teflon-lined lid. Three wipes per sample location will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analyses for PCBs and organochlorine pesticides. Wipe samples for dioxin analysis will be submitted to a START-subcontracted analytical laboratory.

Building Material Sampling

Approximately three to four building material samples per building (Buildings 1, 2, 3, and the Production Building) will be collected from insulation, wood, brick, etc. Due to its larger size and lack of previous sampling data for the Production Building, EPA requested that approximately 20 additional samples be collected in the Production Building. Building material samples will be collected by use of a knife, chisel, hammer, or other appropriate hand tools, and will be placed into sample containers. Four 4-ounce jars per sample will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analyses for PCBs and organochlorine pesticides. Building material samples for dioxin analysis will be submitted to a START-subcontracted analytical laboratory.

Concrete Sampling

At two to four locations per building (current and former), samples of concrete building foundation slabs will be collected by use of a DPT rig equipped with a hammer drill attachment. Sample locations will be selected generally based on even spatial coverage of the concrete slab areas and not based on any specific suspect areas in each building. Each sample of concrete chips and dust will be placed into four 4-ounce jars and submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analyses for PCBs and organochlorine pesticides. Concrete samples for dioxin analysis will be submitted to a START-subcontracted analytical laboratory.

DPT Sub-slab Soil Sampling

To assess distribution of COCs in sub-slab and subsurface soils, soil borings will be advanced at 17 locations (2 to 4 per building location). These boring locations will coincide with the concrete coring locations discussed above. Proposed sample locations are depicted on Figure 2 in Appendix B. At each location, continuous soil borings will be advanced by use of a Geoprobe DPT rig equipped with a Macro-Core sampler to top of water table, anticipated at 20 to 25 feet bgs. Upon retrieval of soils from borings, the START contractor will screen soils for volatile organics by use of a hand-held photoionization detector (PID). Samples will be collected from each boring every 5 feet within a 2-foot interval

exhibiting the highest recorded PID reading or visually apparent staining. If no visual anomalies or elevated PID readings are observed, grab samples will be collected every 5 feet (0-2', 5-7', 10'-12', etc.) from beneath the concrete slab to the water table. Sampling interval selection will depend on observations at the site by field personnel, and may be adjusted, if deemed appropriate. Each soil boring will be continuously logged. PID readings, observed staining, and soil lithology will be recorded on boring logs.

The grab samples for volatile organic compounds (VOCs) analysis will be collected in accordance with EPA SW-846 Method 5035. Each sample will include two 40-milliliter vials preserved with sodium bisulfate containing approximately 5 grams of soil, and two unpreserved 40-milliliter vials packed with soil. The remaining soil will be removed from the sampler and placed in a disposable aluminum pie pan or plastic bag for homogenization, and then transferred to three 4-ounce jars. Soil samples will be submitted to EPA Region 7 laboratory in Kansas City, Kansas for analyses for PCBs, organochlorine pesticides, and chlorinated herbicides. Soil samples from the shallow sample interval (0-2') from each boring location will be submitted to a START-subcontracted analytical laboratory for dioxin analysis.

Pertinent data, including analyses to be performed and exact sample locations, will be recorded on field sheets for each sample. All soil samples will be stored in coolers maintained at or below a temperature of 4 degrees Celsius (°C) pending submittal to the analytical laboratories.

Surface Water/Sediment Sampling

Tetra Tech proposes to collect 10 sediment samples within the SPA. Eight of the locations will be evenly spaced around the perimeter of the pond, and two sediment samples will be collected from submerged areas of the pond. Additionally, two surface water samples, one each from the inlet and outfall of the pond, will be collected.

Sediment samples from the pond will be collected within the top 6 inches of pond sediment by use of a hand-held bucket auger or other suitable sediment sampling device and then distributed with the aid of disposable stainless steel spoons. Field personnel will attempt to collect sediment samples from submerged areas of the pond by wading into the pond while wearing chest waders. Health and safety protocols will limit the sampling to submerged areas not greater than waist deep water. Each grab sample collected for VOCs analysis will be placed in four 40-ml glass vials. The remaining sediment will be placed in a disposable aluminum pie pan or plastic bags for homogenization, and then transferred to three 4-ounce jars. These samples will be submitted for PCBs, organochlorine pesticides, and chlorinated herbicides analyses.

Surface water samples collected for VOCs analysis will be collected into three 40-ml vials preserved with HCl. Water samples collected for analysis of PCBs, organochlorine pesticides, and herbicides will be collected in two 1-liter amber glass bottles. Sediment and surface water samples will be submitted to the EPA Region 7 laboratory for analyses for VOCs, PCBs, organochlorine pesticides, and chlorinated herbicides.

Pertinent data, including analyses to be performed and exact sample locations, will be recorded on field sheets for each sample. All sediment/water samples will be stored in coolers maintained at or below a temperature of 4°C pending submittal to the EPA Region 7 laboratory.

QUALITY CONTROL

To evaluate sample quality control (QC), one equipment rinsate blank (water), one field blank (water), and one trip blank (water) will be collected, as specified in Section 2.5 of the QAPP form. The equipment and field blanks will be submitted for analysis for VOCs, PCBs, dioxin, organochlorine pesticides, and chlorinated herbicides. The trip blank sample will be submitted for analysis of VOCs.

To assess decontamination procedures applied to Geoprobe soil sampling equipment, the equipment rinsate sample will be collected during the course of field activities (as determined by the START Project Manager) following decontamination of the Geoprobe sampler. Decontamination of the Geoprobe sampler and rods will proceed by use of a tap water and Alconox wash and tap water rinse. Following decontamination, the equipment rinsate sample will be collected by pouring deionized water, supplied by the EPA Region 7 laboratory, through the soil sampling apparatus (including the unlined cutting shoe) and into the appropriate sample containers.

The field blank sample will be collected during the sampling event to assess field- and/or laboratory-introduced contamination. The field blank sample will be prepared by START field sampling personnel by pouring deionized water, supplied by the EPA Region 7 laboratory, directly into the sample containers.

The water trip blank sample, prepared by the EPA Region 7 laboratory, will accompany (and be submitted with) the samples. Results from analyses of the trip blank samples will determine whether any cross-contamination of samples will have occurred during sample shipment.

Field duplicate samples of wipe samples, concrete samples, soil samples, sediment samples, and surface water samples will be submitted at a frequency of at least 5 percent of lab-submitted samples (1 duplicate per 20 samples of each matrix submitted to the lab) to assess total method precision. Analytical results

from field duplicate samples will be referenced to calculate the relative percent difference (RPD) between each set of duplicate pair results for each reported analyte. The higher concentration of each analyte in each duplicate sample pair will be used at the discretion of the EPA Project Manager. Analytical accuracy will be determined via analysis of laboratory-prepared spikes and duplicates.

INVESTIGATION-DERIVED WASTES

Disposal of investigation-derived wastes (IDW) and procedures for equipment and personal decontamination will be addressed in a site-specific health and safety plan prepared by Tetra Tech START. IDW is expected to consist primarily of disposable sampling supplies (gloves, paper towels, pie pans, etc.) that will be disposed of off-site as uncontaminated solid waste. Excess soil from DPT soil sampling activities will be placed back into the borehole from which it was collected.

ANALYTICAL METHODS

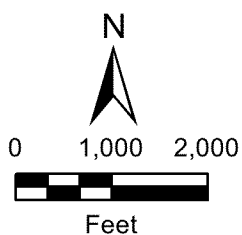
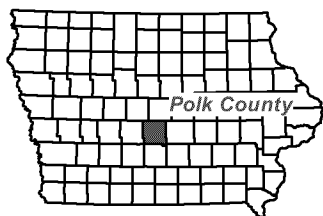
An Analytical Services Request (ASR) form will be completed by START and submitted to the EPA Region 7 laboratory and the START-subcontracted analytical laboratory prior to field activities. Appropriate containers and physical and chemical preservation techniques will be employed during field activities to help verify acquisition of representative analytical results. Standard detection limits and 30-day turnaround times are appropriate for this project. All analyses will accord with the SOPs and methods referenced or described in this QAPP. The data generated by the investigative activities will be evaluated by EPA and Tetra Tech risk assessors to determine if contamination at the site presents an unacceptable risk to human health and the environment.

REFERENCES

U.S. Environmental Protection Agency (EPA). 1996. EPA Superfund Record of Decision, Des Moines TCE, EPA ID: IAD980687933, OU 02, 04, Des Moines, IA. December 13.

APPENDIX B

FIGURES



Des Moines TCE Site
Des Moines, Iowa

Figure 1
Site Location Map

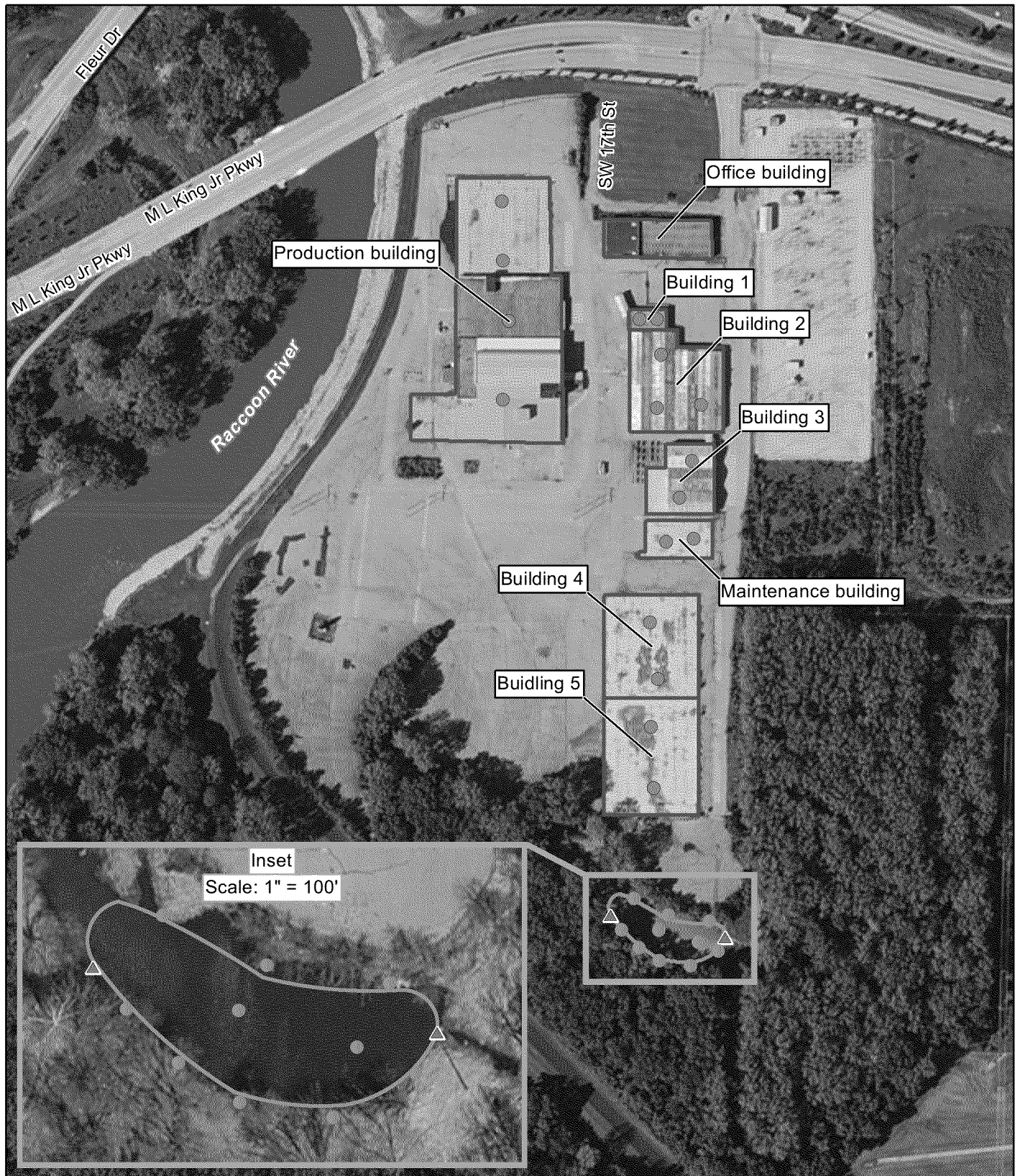


Source: USGS Des Moines SW, IA 7.5 Minute Topo Quad, 1956
USGS Des Moines SE, IA 7.5 Minute Topo Quad, 1956

Date: 9/5/2016

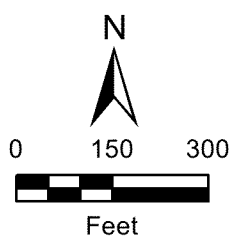
Drawn By: Clayton Hayes

Project No: X9025.16.0144.000



Legend

- Proposed concrete/sub-slab soil sample location
- Proposed soil/sediment sample location
- ▲ Proposed surface water sample location
- ▭ Building location
- ▭ South pond location



Des Moines TCE Site
Des Moines, Iowa

Figure 2
Proposed Sample Locations



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Source: ESRI, ArcGIS Online Maps, World Imagery, 2014

Date: 5/5/2016

Drawn By: Clayton Hayes

Project No: X9025.16.0144.000